

CLAIMS

1. 1. A method of classifying an image, the method comprising:
 2. obtaining an image;
 3. determining one or more classification thresholds;
 4. determining the concentration ratio for the image;
 5. comparing the concentration ratio to at least one of the one or more classification thresholds; and
 7. classifying the image based on the comparison of the concentration ratio to at least one of the one or more classification thresholds.
1. 2. A method as claimed in claim 1 wherein determining the concentration ratio for the image includes determining the luminance components of pixels in the image.
1. 3. A method as claimed in claim 1 wherein determining the concentration ratio for the image includes determining the grayscale components of the image.
1. 4. A method as claimed in claim 1 wherein determining the concentration ratio for the image includes generating a histogram for the image.
1. 5. A method as claimed in claim 1 wherein determining one or more classification thresholds includes a training process.
1. 6. A method as claimed in claim 1 wherein the training process includes analyzing a set of images having known classifications.
1. 7. A method as claimed in claim 1 wherein analyzing a set of images having known classifications includes determining a concentration ratio for each image in the set of images.
1. 8. A method as claimed in claim 1 wherein determining the concentration ratio for each image in the set of images includes generating a histogram for each image.
1. 9. A method as claimed in claim 1 wherein determining one or more classification thresholds includes determining a threshold for text images and a threshold for photographic images.

1 10. A method as claimed in claim 1 wherein classifying the image based on the
2 comparison of the concentration ratio to at least one of the one or more classification
3 thresholds is performed according to the following

4 If ($CR < T$) image type = text

5 If ($T \leq CR < P$) image type = graphic

6 If ($P \leq CR$) image type = photographic

7 where CR is a concentration ratio of the image, T is a threshold for text images and P
8 is a threshold for photographic images.

1 11. A method as claimed in claim 1 wherein determining the concentration ratio for the
2 image includes determining the concentration ratio according to the following

3
$$CR = \left(\sum_L P_L \right)^n / \left(\sum_L P_L^n \right)$$

4 where CR is a concentration ratio, n is greater than 1, and P_L is a population at a level
5 L .

1 12. A method as claimed in claim 1 wherein n is an even integer.

1 13. An image classifying processor, the processor configured to obtain an image, obtain
2 one or more classification thresholds, determine a concentration ratio for the image, compare
3 the concentration ratio to at least one of the one or more classification thresholds, and classify
4 the image based on the comparison of the concentration ratio to at least one of the one or
5 more classification thresholds.

1 14. An image classifying processor as claimed in claim 1 wherein the processor is
2 configured to determine the luminance components of pixels in the image.

1 15. An image classifying processor as claimed in claim 1 wherein the processor is
2 configured to determine the grayscale components of the image.

1 16. An image classifying processor as claimed in claim 1 wherein the processor is
2 configured to generate a histogram for the image.

1 17. An image classifying processor as claimed in claim 1 wherein the processor includes
2 a memory and the memory includes a threshold for text images, and a threshold for
3 photographic images.

1 18. An image classifying processor as claimed in claim 1 wherein the processor is
2 configured to classify the image based on the comparison of the concentration ratio to at least
3 one of the one or more classification thresholds according to the following

4 If ($CR < T$) image type = text

5 If ($T \leq CR < P$) image type = graphic

6 If ($P \leq CR$) image type = photographic

7 where CR is a concentration ratio of the image, T is a threshold for text images, and P
8 is a threshold for photographic images.

1 19. An image classifying processor as claimed in claim 1 wherein the processor is
2 configured to determine the concentration ratio for the image according to the following:

$$CR = \left(\sum_L P_L \right)^n / \left(\sum_L P_L^n \right)$$

4 where CR is a concentration ratio, n is greater than 1, and P_L is a population at a level
5 L .

1 20. A method of processing an image, the method comprising:

2 capturing an image of an object;

3 classifying the image in a class using a concentration ratio;

4 using the class to modify the operation of an image capturing device; and

5 applying controlled, equalization to an image generated by the image capture device,
6 where the controlled, histogram equalization uses a concentration ratio.

1 21. An image processing system comprising:

2 an image capture device;

3 an image classifier coupled to the image capture device in a feedback loop; and

4 a controlled, equalization processor coupled to the image capture device.

1 22. An image processing system comprising:

2 an image capture device configured to capture an image; and
3 an image classifier coupled to the image capture device in a feedback loop, the image
4 classifier configured to determine a concentration ratio for the image, compare the
5 concentration ratio to at least one or more classification thresholds, and classify the image
6 based on the comparison of the concentration ratio to at least one of the one or more
7 classification thresholds.

1 23. A computer-readable medium containing instructions for processing an image by:
2 obtaining an image;
3 determining one or more classification thresholds;
4 determining the concentration ratio for the image;
5 comparing the concentration ratio to at least one of the one or more classification
6 thresholds; and
7 classifying the image based on the comparison of the concentration ratio to at least
8 one of the one or more classification thresholds.